

Missouri Herculaneum Lead
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Herculaneum Needs Assessment Final Report

October 2002

Herculaneum Lead Smelter Site

40172947



SUPERFUND RECORDS

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Missouri Department of Health and Senior Services**

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Purpose

To help plan future health education efforts in Herculaneum, Missouri, a community needs assessment was conducted in October 2002. The goal was to document and respond accordingly to community awareness about the primary chemical of concern, evaluation of educational efforts to date, knowledge about ongoing site activities, methods of learning information about the site activities, and concerns about the site.

Background

Site Description

The Herculaneum lead smelter is an active facility that has been in operation in this community since 1892. The Doe Run Company currently owns and operates the smelter. The facility is located in Herculaneum, Missouri, approximately 25 miles south of St. Louis, Missouri, on the Mississippi River. It abuts residential neighborhoods on the north, west, and south, with the Mississippi River on the east. A lead ore concentrate is processed at the smelter. The ore is transported by truck from eight lead mines operated by the company near Viburnum, Missouri, approximately 75 miles south-southwest of Herculaneum. The 52-acre Herculaneum facility consists of a smelter plant, 24-acre waste slag storage pile, and an onsite sulfuric acid plant.

The city of Herculaneum has an estimated population of 2,805 persons according to the 2000 US Census. Several homes are within 200 feet of the smelter plant, and at least four homes are within 200 feet of the slag pile. Three schools are in the city: a high school, a junior high school, and a middle school. The elementary school is in nearby Pevely. There are no licensed day-care facilities in the city of Herculaneum. Ongoing environmental sampling has shown lead contamination throughout the community, particularly areas east of Hwy 61/67 which are closest to the smelter.

Needs Assessment 2001

Previous needs assessment data were collected in 2001 through concerns expressed during the Community Advisory Group (CAG) meetings and informal one-on-one conversations with community members and CAG leaders. At that time, the average attendance at the CAG meetings was approximately 200 residents. Environmental concerns consisted of elevated air emissions, contaminated soils, dust generated from trucks carrying lead ore concentrate and slag pile issues. Health concerns were expressed regarding lead and cadmium, with more emphasis on lead poisoning. The primary health concerns of the community were lead poisoning and potential health effects on their children and themselves. Also, there were many residents who expressed concerns about cancers, particularly related to the kidney. Additionally, there were concerns about multiple sclerosis (MS) and amyotrophic lateral sclerosis (ALS, also known as Lou Gehrig's Disease). The primary sources of exposure that the community was concerned about were air emissions from the smelter, dust from the slag pile, dust from the trucks carrying concentrated lead ore to the smelter, and contaminated soil. The community expressed frustration about the length of time designated to clean up the site per the initial agreement between the government and the potentially responsible party (PRP). They wanted more done and at a faster pace. Some community members wanted the Doe Run Company (the PRP) to cease smelting operations immediately. This, in turn, would stop continued release of lead into air and soil.

However, there were some community members who felt that the issue of lead in Herculaneum was being exaggerated

Site Activities

Since the initial needs assessment data and environmental samplings were collected many health-related and environmental activities have occurred. These activities included additional environmental sampling, changes in the hauling of lead concentrate on trucks, haul-route street cleaning, yard soil sampling, yard soil removal, voluntary buyouts, reduction in air emissions, interior cleaning of homes, several blood lead testing events, a special community-wide census, exposure investigations, several written health consultations, educational activities and a community cancer investigation (inquiry).

Additional health actions currently in process include a study on MS and ALS. The need for further health studies will be determined through Missouri Department of Health and Senior Services (DHSS), Agency for Toxic Substances and Disease Registry (ATSDR) and Herculaneum community members. If funding becomes available, a work group will be assembled to determine the focus of additional health studies.

Educational Activities

Prior to the October 2002 needs assessment, health education activities consisted of

- Presentations made at monthly CAG meetings, to school teachers from K-12th grades and to a few members of the church near the smelter,
- Presentations given by physicians with expertise in lead poisoning to physicians at a nearby hospital, local community leaders, and community members,
- Distribution of educational materials during presentation events and at CAG meetings,
- Door-to-door delivery of educational packets during the DHSS census in October 2001 and during the DHSS registry/census update/needs assessment in October 2002,
- Dissemination of educational materials during special blood lead testing events
- One-on-one conversations with community members, and community leaders as well as local, state, and federal politicians
- Contributions are also made to a multi-governmental agency newsletter when it is produced, and
- Distribution of health consultations by way of the DHSS web site in addition to direct mail to CAG leaders and other community members are other methods currently used to address community concerns

Activities Occurring During the 2002 Needs Assessment Survey

At the time of the October 2002 Herculaneum needs assessment survey, health consultations on arsenic and cadmium as well as sulfur dioxide were in process but had not been publicly released. Both were released in November 2002. Yard soil testing, yard soil remediation, interior cleaning of homes, first phase of the voluntary buyout process, and ongoing sampling to determine if recontamination is occurring was taking place at the time of the needs assessment survey.

Methods

In October 2002, all occupied homes in Herculaneum received a needs assessment survey and educational material. For households on the east side of Hwy 61/67 a registry was developed to gather contact information from residents for future health studies and census information was updated for this specific area. For households on the west side of Hwy 61/67 needs assessment surveys and educational material were distributed.

All households received the same needs assessment survey (Appendix A). However, to differentiate between the east side (closest to smelter) and west side (further from smelter) of Hwy 61/67 the surveys were color-coded. Residents on the east side received a yellow colored survey and residents on the west side received a blue colored survey. No differentiation within the east side was made between the residents within the buyout zone (3/8 mile from smelter) and residents living in the east side of Hwy 61/67 but outside the buyout zone.

Herculaneum was divided into six areas. Seven teams consisting of two individuals per team went door-to-door. The teams were composed of employees of DHSS, ATSDR, and the Jefferson County Health Department.

Residents on the west side of Hwy 61/67 (area further from the smelter), received a needs assessment survey and educational material about lead. If the resident was home and was at least 18 years old the resident was interviewed person-to-person. If the resident was not home or did not have an adult present, a packet containing the survey, a self addressed stamped envelope and an educational flyer about lead poisoning was hung on the door.

The same procedure was followed with residents on the east side of Hwy 61/67 with the exception that more effort was placed on person to person interviews due to registry and census activities. Some residents also received an additional educational flyer on the benefits of allowing the Environmental Protection Agency (EPA) and the Potential Responsible Party (Doe Run Co.) contractors access into their homes for interior home cleaning.

Before the needs assessment survey, registry, census update and distribution of educational materials was conducted, prior notice was given as a courtesy to the Missouri Department of Natural Resources (MDNR), EPA, Missouri Attorney General's Office, the mayor of Herculaneum, the Herculaneum police department and the Doe Run Company.

Most surveys were completed through person-to-person interviews. Some completed the surveys and mailed them to DHSS. Four weeks after the surveys were distributed, no more responses were received and compilation of survey results began.

Results

The total number of surveys distributed was 966. Of those distributed, a total of 444 surveys were completed resulting in a response rate of 46.0% (444/966).

	Surveys Distributed	Surveys Completed	Response Rate
East Side of Hwy 61/67 (Yellow)	559	310 (278 by interview and 32 by mail)	55.5%
West Side of Hwy 61/67 (Blue)	407	134 (121 by interview and 13 by mail)	32.9%
Totals for Community	966	444	46.0%

Of the 966 surveys distributed, 559 were on the east side of Hwy 61/67 and 407 were on the west side of Hwy 61/67. A total of 310 east-side surveys were completed making the response rate 55.5% (310/559). A total of 134 west side surveys were completed making the response rate 32.9% (134/407).

Survey Questions

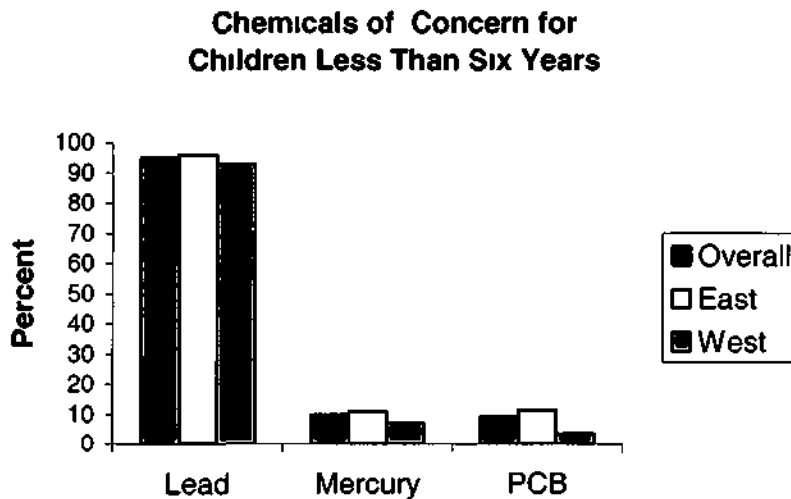
The survey consisted of six questions. The following is a question-by-question breakdown of responses received.



Question #1

Which chemicals are of most concern to children less than six years old in Herculaneum?

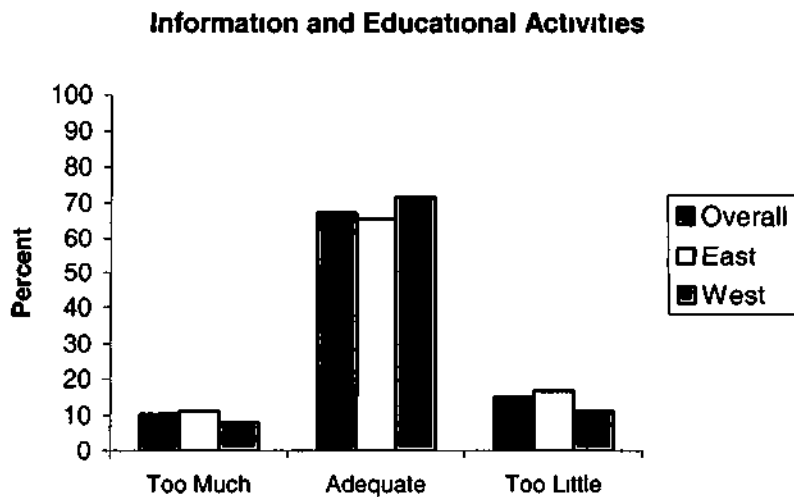
- A total of 95.2% (373/392) of respondents identified lead as the chemical of most concern to children less than six years old in Herculaneum. (Fifty-two did not respond to this question therefore $444 - 52 = 392$. The breakdown for non response for this question is east 31 and west 21.) A slightly higher percentage of respondents on the east side 96.1% (268/279) compared to the west side 92.9% (105/113) think lead is the chemical of most concern to children less than six years old in Herculaneum.
- Following lead, a total of 10% (39/392) of respondents identified mercury and 9.2% (36/392) of respondents identified polychlorinated biphenyls (PCBs) as the chemicals of most concern to children less than six years old in Herculaneum. Other chemicals identified include trichloroethylene (TCE), cadmium, and arsenic.



Question #2

Information/educational activities in the community from health agencies has been too much, adequate or too little If too little or too much, please explain

- A total of 67.3% (299/444) of respondents thought the information and educational activities conducted in the community were ADEQUATE. A slightly higher percentage of respondents on the west side (71.6% - 96/134) compared to the east side (65.5% - 203/310) think the information and educational activities are adequate.
- A total of 10.4% (46/444) of respondents thought the information and educational activities conducted in the community were TOO MUCH. Respondents from the east side (11.3% - 35/310) had a slightly higher percentage than respondents on the west side (8.2% - 11/134).
- A total of 15.1% (67/444) of respondents thought there was TOO LITTLE information and educational activities conducted in the community. More respondents from the east side (16.8% - 52/310) thought that there was not enough information compared with residents living on the west side (11.2% - 15/134).



A sample of responses from residents for **Question # 2** include

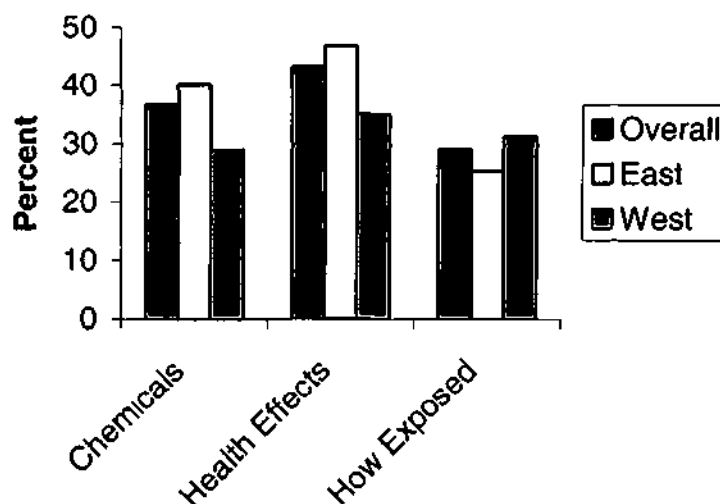
	Too Little	Too Much
East	<ul style="list-style-type: none"> Information not specific enough More information from long term studies needed What happens when lead poisoned as children and as a result what long-term health effects would an adult have? Not enough focus on other chemicals in town Feel they are not informed like they should be 	<ul style="list-style-type: none"> Governmental agencies have overblown the issue Conflicting information confusing What is accurate? Blown out of proportion Neighbor kids and grandkids in area are fine
West	<ul style="list-style-type: none"> Would like more education regarding area Don t hear how things have changed Is there a concern in this neighborhood itself? Don t hear much about what s going on with cleanup Doesn t know what can be done or what to do to protect yourself or your family 	<ul style="list-style-type: none"> Everyone in general media residents and DOH have made too much of it Lead is not a problem Blown out of proportion People have lived in Herky for years and are fine

Question #3

What health issues would you be interested in learning more about?

- A total of 43.2% (192/444) of residents were interested in learning more about the health effects of lead, arsenic, and cadmium. In addition, respondents were also interested in how they would be exposed to these chemicals (29.1% - 129/444). As far as other topics (10.8% - 48/444), sulfur was the most commonly mentioned chemical for which residents would like to learn more about. Concerns also revolved around pollution of the air by these chemicals and the resulting health effects.
- The east side respondents placed more emphasis on the health effects of the various chemicals (46.8% - 145/310) than the west side respondents (35.1% - 47/134). However, the west side respondents had more concerns on how people would come into contact with the chemicals (37.3% - 50/134) compared with the east side respondents (25.5% - 79/310).

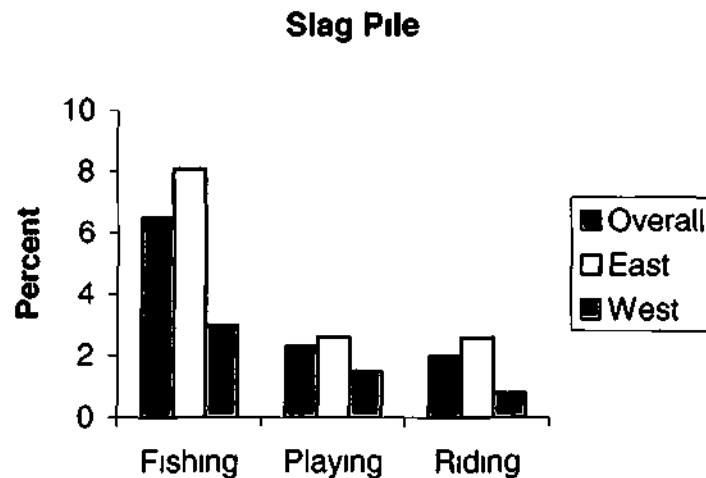
Respondents Interested In Learning More About



Question #4

Within the past six months, do you know or have seen anyone fishing, playing/climbing or riding ATVs/motor bikes near the slag pile?

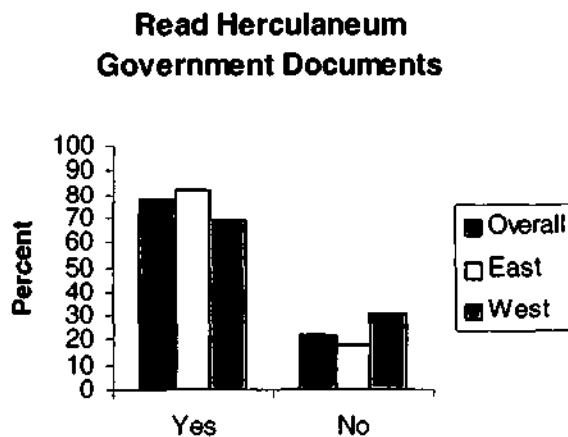
- Most of those who responded were unfamiliar with the slag pile, did not know where it was, or did not go near the area of the slag pile to be able to notice activities that may take place on or near it. For those who have seen activity near the slag pile, fishing was the most common response (6.5% - 29/444) followed by playing or climbing on the slag pile (2.3% - 10/444) and riding pedal bikes, ATVs or motor bikes on the slag pile (2% - 9/444).



Question # 5

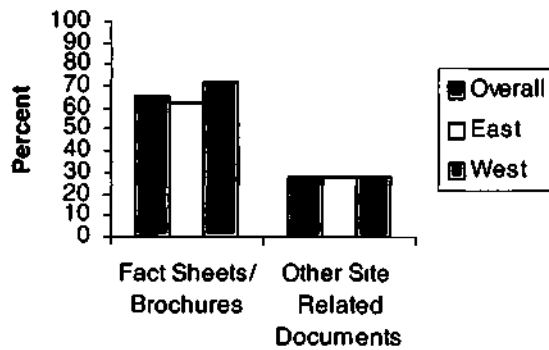
Have you read government documents related to issues in Herculaneum? If you have, was it a fact sheet, brochure or other document and was it easy to read?

- The total number of responses to Question #5 was 417. Most respondents (78.4% - 327/417) have read some type of government document related to Herculaneum issues. A greater percentage of people who live on the east side have read more government documents (82.1% - 248/302) than people on the west side (68.7% - 79/115).
- Of the 78.4% who responded YES, fact sheets or brochures were the most often read (65.1% - 213/327) compared to other site-related documents. Of the materials that were read (82.6% - 270/327) respondents found them easy to read and understand.
- Responses to Question #5 also indicated that most of the respondents read information that is received through direct mail about site-related activities. Therefore, informing the community about site-related activities through direct mail is the best way to inform all residents. It was also indicated that respondents have received information through the mail from various parties including governmental agencies, community groups and Doe Run Company. Another common way respondents keep informed is by reading the newspaper. Watching TV was another way, however, it was not mentioned as often as the other two methods.

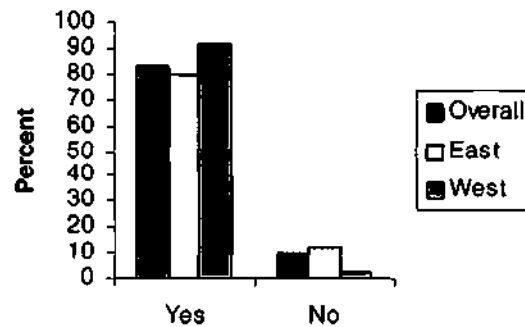


Question # 5 (continued)

Type of Documents Read



Easy to Read and Understand

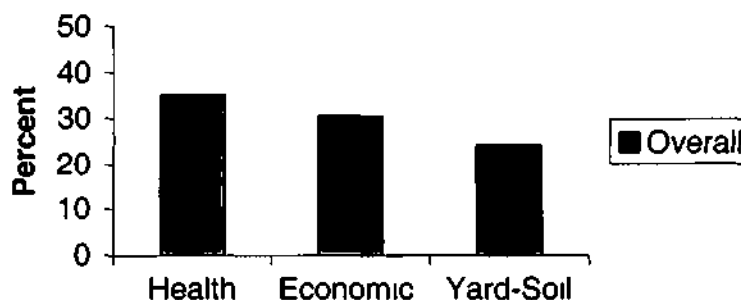


Question #6

What are your top three (3) concerns about the environmental activities taking place in Herculaneum? (e.g., health information, concerns about health effects, yard-soil removal, voluntary buyout, interior home cleaning, economic losses, stigmatization of community, etc.)

- The total number of responses received for this question was 365. Of those who responded, the overall top 3 concerns were
 - health issues (35.1% - 128/365)
 - economic concerns related to property values or economic losses (30.4% - 111/365)
 - yard-soil removal (24.1% - 88/365)
- The next three highest ranking concerns were stigmatization of the community, cleanup activities in general, and voluntary buyout issues. Other issues mentioned were concerns about information (accuracy, quantity, type of message), interior home-cleaning, haul-road issues, water, air, mosquitoes/West Nile Virus, failing sewage systems, and gardening.
- Of those who responded from the east side, the top three concerns were health issues (33.2% - 85/256), economic concerns (29.7% - 76/256), and yard-soil removals (28.9% - 74/256).
- Of those who responded from the west side, the top three concerns were health issues (39.4% - 43/109), economic concerns (32.1% - 35/109), and stigmatization of the community (29.4% - 32/109).

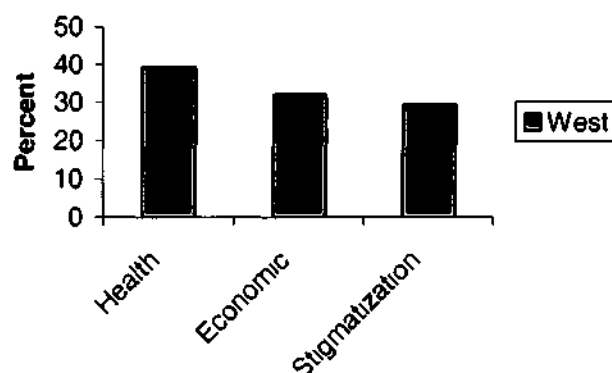
Top Three Concerns



East Side Top Three Concerns



West Side Top Three Concerns



The following is a sample of community responses to Question # 6

Health Issues

- Health effects for everyone not just children
- Long-term health effects from long-term exposure
- Current health effects from chemicals in the air—could it cause allergies diseases other health problems?
- Lead in long bones
- Concerned about effects on unborn babies and fertility problems

Economic Concerns

- Concerns about property values (most commonly mentioned concern in this category)
- Economic losses for community
- Want Doe Run to be accountable but do not wish to see the company closed down/bankrupt

Yard-Soil Removals

- Yard removal not adequate
- Don't want their yard done after seeing some of the others soil
- Digging up yards and yards getting recontaminated What they are doing doesn't work
- Yard soil removal unnecessary
- Problems with yard soil removal—weeds and poor soil
- Why do they keep jumping around in yard cleanup? Chemicals can flow from one yard into a cleaned yard Not making sense If you want to reduce recontamination, start at the end of the street and do the entire street

Stigmatization of Community

- Concerned about the impact of the reputation of the community and its school
- Blown way out of proportion Not as big a deal as people are saying
- Publicity has ruined town
- We have lived near the plant for many years and raised two children My husband worked at the plant as well as his father for multiple years We never had any problems
- Chemicals everywhere and all the publicity has hurt Herculanum property owners I don't care where you live, eventually you die
- We have a nice town There is no lead problem Leave our community alone Go work on real health issues Prevent West Nile Virus

Conclusions

The following conclusions are in random order

- 1 Conducting a needs assessment by personal interview techniques is more successful than by surveys returned through the mail (89.9% - 399/444 completed surveys through person-to-person interviews versus 10.1% - 45/444 surveys returned through the mail)
- 2 More surveys were completed by residents living east of Hwy 61/67 (55.5% - 310/559) than those living on the west side of Hwy 61/67 (32.9% - 134/407). However, a registry to obtain contact information of community members for the possibility of future health studies was taking place in conjunction with the needs assessment. Therefore, more repeated attempts to contact residents were made on the east side versus the west side.
- 3 Most residents know that lead is the chemical of concern in Herculaneum, especially for children less than six years old. However, there are varying beliefs about whether lead is a problem for children and adults.
- 4 Currently, most residents receive site information from a variety of sources through the mail (community groups, Doe Run Company, governmental agencies). Newspapers are also a popular way for residents to get information about the site. Some of the information from the various sources may have been conflicting, and therefore, have caused some confusion as to the accuracy of those documents.
- 5 Direct mail is the most reliable way for all residents to receive site information.
- 6 There may not be enough information distributed by governmental agencies about site activities to individuals who do not attend the community advisory group (CAG) meetings and/or live west of Hwy 61/67 based upon specific responses from community members.
- 7 A majority of the respondents believe that the information/educational activities in the community has been adequate. However, based on the responses, information about the site is coming from a variety of different sources, and many respondents did not differentiate the health agencies from other governmental agencies.
- 8 Respondents expressed a desire for more information on the health effects of site-related chemicals, particularly long-term health effects of lead on children and adults, health effects of cadmium, arsenic, and sulfur.
- 9 Most residents have not seen people fishing, playing, or riding ATVs, motor bikes, or pedal bikes on the slag pile. However, most also responded that they do not go in the area near the slag pile to notice these activities.
- 10 Fact sheets or brochures are most often read versus other government documents. A majority of respondents have read government documents related to issues in Herculaneum and thought the fact sheets were easy to read and understand. Other government documents were not as easy to read and understand.

- 11 East-side residents seemed better informed about site activities than west-side residents
Responses indicated a greater percentage of east-side residents have read government documents (The smelter is on the east side)
- 12 The top three concerns of community members are concerns about their health economic concerns related to site activities especially those relating to property values and concerns about yard soil remediation activities In addition there was significant concern about the community being stigmatized by the ongoing activities and publicity

Recommendations

The information gathered from this assessment indicates that future educational efforts should include

- ◆ Use direct mail as the primary means for communicating with residents and informing them about site activities
- ◆ Contribute to a multi-agency newsletter on a regular basis to improve communication with all Herculaneum residents
- ◆ Continue attending CAG meetings to allow information distribution directly to the community and gather feedback from the community in a face-to-face format
- ◆ Other educational opportunities could include creation of a short summary fact sheet of each health consultation or other health document produced by the DHSS or ATSDR for this site

Report prepared by

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2/03

Herculaneum Needs Assessment Survey

October 2002

- 1 Please check which chemicals are of most concern to children less than six years old in Herculaneum?
 - ☐ TCE
 - ☐ Lead
 - ☐ Mercury
 - ☐ PCB
 - ☐ Other _____

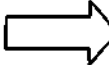
- 2 Do you believe that information/educational activities in the community from health agencies has been
 - ☐ Too much ☐ Adequate ☐ Too little
 - If too little or too much, please explain

- 3 What health issues would you be more interested in learning more about?
 - ☐ Chemicals of concern Lead Arsenic Cadmium
 - ☐ The health effects of those chemicals
 - ☐ How people come into contact with those chemicals
 - ☐ Other topics _____

- 4 Within the past six months do you know or have seen anyone
 - ☐ Fishing near the Slag Pile?
 - ☐ Playing/climbing on the Slag Pile?
 - ☐ Riding ATVs/motor bikes on the Slag pile?

- 5 Have you read government documents related to issues in Herculaneum? YES NO
 - ☐ Fact Sheet/brochures ☐ Other site-related health documents
 - IF YES are documents produced by the health agencies YES NO
(DHSS and ATSDR) easy to read and understand?

- 6 What are your top three (3) concerns about the environmental activities taking place in Herculaneum? (e.g. health information concerns about health effects yard soil removals voluntary buyout interior home cleaning economic losses stigmatization of community etc.)


 (over)

Thank you for your help!

Please return this survey in the Self-Addressed Stamped Envelope provided or send to

Lorena Anderson
Missouri Department of Health and Senior Services
PO Box 570 930 Wildwood
Jefferson City MO 65102

You may also call me with your responses or if you have any questions at (800) 392-0272 or
(573) 751-6160

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